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Abstracts

REVISTELE TEHNICE AGIR
 Vol. II, No. 5, September - October 1948

1. A new method for extracting sulfur and metals from gold-containing pyrites.

By V. Oghina

Rumania treats 25,000 tons of gold-containing pyrites per year. These pyrites contain 36% of ~~xx~~ iron, all of which is lost in the waste, while the sulfur is utilized only in the form of sulfur dioxide and sulfuric acid, and not as pure sulfur which is needed for the chemical industry and for wine-growing.

The recovery of iron and the extraction of sulfur are of great importance for industry. A new process is described here, in which the ~~classical~~ ^{classical} roasting process is replaced by calcination and fusion in a sulfuric acid furnace. A pilot plant with a capacity of 1000 tons of pyrites per day has been constructed.

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REVISTELE TEHNICE AGIR
Vol. II, No. 5, September - October 1948

2. The use of closed runners in casting of steel.
By L.I. Fantalov and L.I. Levi

Metal, in passing from the liquid to the solid state, goes through three stages:

Contraction in the liquid state

Contraction in the liquid-solid state

Contraction in the solid state.

Contraction in the second phase necessitates the use of runners which function as reservoirs of liquid metal and fill the empty spaces formed as a consequence of the contraction and protect the ~~castpiece~~ casting from the formation of cavities.

The ~~find~~ different methods of fusion (syphon tapping, lateral runners, remelting, blind runners, without atmospheric pressure) were investigated. It was ~~is~~ established that the last method of fusion affords the best cooling conditions.

The experimental results, the construction of the runners, and the method of computing the feed elements are described.

The new method can be applied for all kinds of castings, especially with alloys which contract considerably. It involves no technical complications in operation, reduces the cleaning process, assures an economy of 60% in the consumption of molten metal and brings about an orderly crystallization in the structure of the metal. This had not been possible with any other previously used method.

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REVUE DE LA TRIBUTION AGIR
Vol. VI, No. 5, September-October 1948

3. The manufacture of pumping rods for oil wells By M. Popovici

The manufacture of oil well pumping rods, used for moving the piston of the delivery pump ("pompe canadienne") in the delivery pipeline and for transmitting the motion of the beam of the pump assembly to the piston, is carried out only at the Resita plant.

Manufacture is divided into the following phases:

- Forging of the head in an automatic machine
- Punching and heat treatment
- Determination of Brinell hardness
- Adjustment
- Drawing on two heads.

The evolution of each stage, the difficulties and the methods by which they were overcome are described.

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REVISTELE TEHNICE ATER

Vol. II, No. 6, November - December 1948, Bucharest.

1. Improved cast iron. By D. Raseev.

The GOST V -1412 -42 and 2611 - 44 standards show the properties of cast iron with a yield point of 12 to 38 kg/mm², bending resistance of 28 -56 kg/mm² and compression resistance of 50 - 120 kg/mm².

Countries with highly developed industry tend to substitute cast iron for cast or forged steel, if the metal is to undergo high stresses.

~~Examples~~ The head stock bars of large boring machines, of 15 to 18 m length, 500 to 550 mm diameter and 20 tons weight, pinion wheels, and 2000 HP Diesel engine piston rods and crankshafts are given as examples.

Mention is also made of the system used by Ford for substituting castings for forgings, which has led to the development of an automobile engine made almost entirely of castings.

Soviet industry is ~~large-scale improved castings~~ manufacturing improved castings on a large scale for various elements of heavy industrial equipment. For example, the principal parts of a construction of a total weight of 4057 tons, a length of 180 m and a total power output of 2000 KW, designed and constructed by twelve Soviet factories during 1945 within the space of one year were made of improved cast iron.

The production of high-grade cast iron has been developed intensely during the past 20 years, especially in England and the United States.

In the Soviet Union, a number of Scientific Research Institutes are working on the problem of improved cast iron, such as the VISKhOM, ENIMS, TsNIITMash, the Moscow Steel Institute, The Urals Industrial Institute, the Stankolit Factory, Restsel Mash., the Kiyev Bolshevik Factory, the Kharkov Tractor Factory, the Gorlovsk Machine Factory, Hral Tyazh Mash, etc., which all use this method for making high-grade castings.

The article gives a short outline of the principles and methods of producing improved cast-iron, and a number of results obtained with this method at the Foundries of the Central Workshops at Campina and in the factories of Floesti.

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REVISTELE TEHNICE AGIR
Vol. II, No. 6, November-December 1948, Bucharest

2. Choice of the calculation method and the computation of errors in gears. By B.A. Taitz

The degree of precision of a gear is determined by the operational characteristics of the mechanism, in the form of evaluation of the errors of position, displacement and the no-load run of the kinematic system, and by the determination of the same characteristics with respect to the transmission of force.

It is also necessary to determine the real length of the linear travel, errors of velocity and of acceleration, and the dynamic errors.

Along different lines of thought, the problem is attacked from the point of view of definition of the technological causes of error of these mechanisms, i.e. of the interdependent relationships between the tool machines and the geometric characteristics of the products.

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Abstracts

REVISTE TEHNICE AGIR

Vol. III, No. 5, September - October 1948

1. Mechanization of coal mines. By Constantin Agghir

The stages of mechanization for the industry ~~in~~ general, its aim and the method of determining its economy are discussed.

By citing the order of magnitude of the mass of raw material moved by the coal mining industry, it is explained why this industry is classified as a heavy industry.

A discussion of the characteristics of mining work shows the financial and technical difficulties involved in mechanization and the methods of overcoming them.

The characteristic data of the degree of mechanization ~~of~~ and of concentration underground are given, and the present stage of mechanization of coal mines is shown.

Considering the difficulties of the coal mining industry caused by the competition offered by petroleum and natural gas, the author believes that planned production of fuels, ~~from~~ the viewpoint of available reserves, will help the coal mining industry in intensifying the underground mechanization and in reducing its overhead.

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REVISTE TEHNICE AGIR

Vol. II, No. 5, September - October 1948

2. General description of the Resita-Anina-Nera-Danube Coal field

By V. Cioban

This coal field constitutes a distinct geographical and geological unit. It is made up of mountains of ~~approx~~ height of up to 1200 m, in parallel ranges, and divided into three geographical units by two valleys. The first one includes the mines of Secul, Doman, and Lopac, the second unit contains the Anina-Steierdorf coal field, the third unit is of only secondary importance.

The coal-bearing geological formations belong to the Carbon and Lias strata. The tectonics of the region are characterized by folds, depressions, overfolds, foliate layers, longitudinal and transversal faults, and intrusions of eruptive rock.

The mining installations and the coal deposits are as follows:

1. The Secul mine, with four layers of bituminous coal, very well suited for the production of metallurgical coke. Only two layers are mined. The mine has two shafts. The principal production level is at a depth of 608 m.

2. The Doman mine ~~produces~~ exploits two layers of coal of the Lower Lias. It produces solid non-bituminous coal whose quality varies from one vein to the next.

The mine is characterized by the occurrence of fire-damp which renders mining dangerous. The mine has ~~two~~ two shafts. It is 519 m deep.

3. The Steierdorf - Anina mines exploit two localized ~~coke~~ coal deposits of the Lower Lias. As for tectonics, the mine has an asymmetric anticlinal fold with an almost elliptic horizontal section. The coal layers, limited by the slopes of the anticline, are of solid bituminous coal which is excellently suited for the production of metallurgical coke.

The mine contains underground layers of water, the deposits are under high stress, there are emanations and eruptions of fire-damp, and ~~the~~ spontaneous combustion of the coal occurs occasionally.

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The coal is mined in six shafts, ranging from 458 m to 900 m in depth.

The description concludes with a comparison of this ~~basin~~ coal field with the other Rumanian coal fields, viz. the Brasov field, the coal deposits in the Southern Carpathians and in the Banat.

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REVISTELE TEHNICE AGIR

Vol. II, No. 6, November - December 1948

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1. New developments of drilling in hard and very hard rocks (Continuation of Article in No.5). By M. Stamatiu.

Great progress has been made in the drilling of bore holes in hard or very hard rocks in mines and quarries.

~~That~~ A review is given of the progress made, and ~~of~~ the innovations and modern methods which could be used in Rumania are described.

After the classification of the rocks according to their suitability for drilling (by the method of Protodiakonov, Sukhanov, etc.) and after a study of the methods of drilling bore holes and the tools and machines employed, the author comes to the conclusion that only a pneumatic percussion process can be used ~~here~~. The pneumatic drills give the best results. They have a circular or hexagonal cross-section and are made of Carbon-Manganese steel alloy.

The other conclusions of the article ~~refer~~ refer to the quality of the tool materials, the use of metallic carbide (Cobalt and Tungsten) alloys for drill heads, and the possibilities of increasing the drilling speed and reducing the cost of the operations.

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REVISTE TEHNICE

Vol. II, No. 6, November - December 1948

2. The problem of industrial use of non-metallic minerals in Rumania.

By Ovidiu Bolghiu.

The author investigates the problem of creating industries on the basis of intense exploitation of the non-metallic minerals abundant in Rumania.

The minerals and rocks used for construction are reviewed, viz. gypsum, lime, marble, marl, building stones, gravel, etc. A second category is formed by the minerals and rocks used for the manufacture of refractory materials, in the ceramics industry and for glass manufacture. A number of minerals are also used as raw materials by the chemical industry.

The author suggests that the Central Offices of the nationalized industries study the problem and make practical suggestions.

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Vol. II, No. 6, November - December 1948

3. Scraper conveyors, their development and the possibility of utilizing them
in the Rumanian mining industry

By: Constantin Arghir

A detailed discussion of scraping installations and the improvements made on them. The scraper is compared with other conveying mechanisms.

The shortcomings of the scraper (non-continuous conveying and decreasing yield with increasing distance) are shown, and the two manners to overcome these shortcomings are described.

A discussion of the results of scraper operation in Belgian and French mines leads the author to the conclusion that scraping would be quite feasible in some Rumanian mines.

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Abstracts

REVISTEA TEHNICE AGIR

Vol. II, No. 5, September - October 1948

1. Some technical problems of oil well drilling.

By N.S. Parvulescu.

Several aspects ~~of~~ of the problems caused by the increasing depth of oil wells are discussed.

These problems include : The computation of rods under their own weight (formula 1), the torsion moment of rods under tension and rotation stress (formula 2), the lining required to keep up the well, the diameter of the well in relation to the diameter of the column and the length of the shaft without pipes (formula 4), the resistance of the column under biaxial stress of the exterior pressure and its own weight (formula 5) and drilling equipment capable of withstanding the weight of the rods and of the columns at constantly increasing depths. Formula 6 is a formula obtained by chronometric measurement for determining the length of time of the introduction and removal operations of the rod assemblies

Special attention has been given to the resistance of the columns . The computations for tubings of 5 3/4 ", 7", and 8 5/8" are shown in diagrams for a safety factor of 1.7 in solid ground, and 1.5 in less solid ground. For reinforced columns these factors can be reduced to 1.5 and 1.3 respectively.

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REVISTELE TEHNICE AGIR

Vol. II, No. 5, September - October 1948

1. Chemical Thermodynamics. By V. Pietraru.

This study of synthesis is based on a method using modern research findings. Its aim is to develop ~~thermodynamic~~ intuitive thermodynamic principles which are ~~completely~~ perfectly clear, without abandoning the strict mathematical proofs.

In the course of a new method of explanation of the thermodynamic theories and phenomena it is shown that the difficulty in the development of thermodynamic principles is found in the duality of physical and chemical transformations.]

The mathematical proofs should be complemented by physical principles.

From the definition of the first law of thermodynamics, and the principles of thermodynamics, the author goes to the second law of entropy and the principles connected with it.

Fundamental relationships are determined and illustrated by examples from organic and inorganic chemistry.

The Practical applications, giving the most favorable conditions for reactions, are included.

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REVISTELE TEHNICE AGIR

Vol. II, No. 5, September - October 1948

2 A nitric acid process for the production of cellulose

By N.A. Baranov

The need for high-grade cellulose has led to the extended use of the method of treating wood with nitric acid. This method, known since the 19th Century, could only be put to actual use after a large chemical industry had been set up and high-grade acid-resistant steel had been developed.

The stages of production are discussed: The ^{treating} ~~preparation~~ of the wood, the cooking of the cellulose, its purification, chlorination, cold refining, bleaching and drying. The cellulose obtained by this method is ~~of~~ the same as that obtained from cotton lint, with a content of alpha-cellulose of 98 to 99%, 0.11 % ashes, and a copper index of 0.6.

Specific material and power consumption figures for the manufacture of 1 ton of completely dry beechwood cellulose are given.

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VEGETABLE TANNING AGENTS

Vol. II, No. 5, September - October 1948

3. Laboratory experiments on the economic use of tanning agents.

By Dr. Daniel Juchum.

Description of two laboratory experiments on the economic use of scarce, valuable vegetable tanning agents. The first experiment deals with the use of a domestic synthetic tanning agent "Tanant R", made from petroleum refining waste products, the second experiment deals with the use of formaldehyde in vegetable tanning agents.

It was found that the use of "Tanant R" brings about a great saving of rare vegetable tanning agents, while the vegetable ~~ka~~ extracts provide very quick tanning with the help of formaldehyde. This means a lowering of the investment in raw materials, and increased production capacity. Also, the application of formaldehyde reduces the amount of tanning agent required per unit weight of skins, and maintains the ~~initial~~ original resilience of the skins.

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REVISTE TEHNICE

Vol. II, No. 6, November - December 1949

The problem of industrial use of non-metallic minerals in Romania.

By Ovidiu Bolghiu.

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The minerals and rocks used for construction are reviewed, viz. gypsum, lime, marble, marl, building stones, gravel, etc. A second category is formed by the minerals and rocks used for the manufacture of refractory materials, in the ceramics industry and for glass manufacture. A number of minerals are also used as raw materials by the chemical industry.

The author suggests that the Central Offices of the nationalized industries study the problem and make practical suggestions.